

Issue List and Work Plan for the  
2002 Triennial Review of the  
Water Quality Control Plan for the Sacramento River and San Joaquin River Basins

To meet requirements of Section 303(c) of the Federal Clean Water Act and Section 13240 of the California Water Code, the Central Valley Regional Water Quality Control Board (Regional Water Board) reviews the water quality standards contained in the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) every three years. This Triennial Review consists of conducting a public workshop to receive comments on water quality problems in the two Basins and preparing a work plan which describes the actions the Regional Water Board may take over the next three years to investigate and respond to the problems. Implementation of the work plan depends upon the Regional Water Board's program priorities, resources, and other mandates and commitments. Crucial to successful implementation of the actions is adequate support of the Regional Water Board's Basin Plan activities.

The Regional Water Board began its 2002 Triennial Review by providing a 45-day public notice, culminating in a public workshop, to solicit comments on water quality problems. The public notice (Attachment A) contained a brief description of some problems identified by staff. The notice was mailed to the more than 2700 entities on the Basin Plan mailing list. A shorter notice (Attachment B) was published for one day in each of the five major newspapers covering the Basin Plan area (Attachment C).

The public workshop was held during the regularly scheduled Regional Water Board meeting on 25 January 2002 to receive oral comments. Attachments D and E are copies of the official agenda and minutes, respectively, of the meeting of the Regional Water Board at which the Triennial Review public workshop was held. Comments submitted after the public workshop were also considered in this review. The Regional Water Board received a total of 29 written comments and 18 verbal comments at the workshop. Responses to these comments are contained in Attachment F.

The issues listed below reflect the high priority water quality problems identified from public comments received during the review period and staff knowledge about problems in the Basin. The Regional Water Board does not propose to proceed directly with amendments to the Basin Plan as a result of this Triennial Review. The proposed actions consist of recommended investigations to determine the following:

1. Whether a problem exists.
2. The extent, source, frequency, duration, and magnitude of the problem.
3. Whether the problem can be resolved through a change in the way the Regional Water Board implements, enforces or otherwise gains compliance with existing standards.
4. Whether the problem must be resolved through amending the Basin Plan.

Two levels of actions are specified. Current Actions represent the staff's best judgment about what can be done from FY 02/03 through FY 03/04 to address the issue with available resources. Additional Actions depend on more resources becoming available. The priority for each issue indicates the intended order to address the issues.

Resources to support basin planning activities are very limited. The Regional Water Board annual budget to support basin planning activities regionwide is 0.6 Person Years (PY). From this resource, the Regional Water Board must conduct triennial basin plan reviews and prepare and propose amendments to the two Basin Plans that cover the Region. The FY 01/02 allocation was exhausted conducting the two triennial reviews. A new Triennial Review will need to be completed three years from now. This leaves 1.2 PYs for 2 years (the two years between triennial reviews) to consider issues that may warrant revisions to the two Basin Plans. Existing resources only allow a small portion of the highest priority issue to be addressed. However, some stakeholders have provided funding for staff and studies to move certain issues forward. Also, other programs, such as the TMDL program, are including resources complete basin plan amendments. These other sources of funding are identified in the workplan. The existing basin plan budget will be used to provide support in the preparation of basin plan amendments developed with these other sources of funding.

Based on the staff analysis, the following issues have been identified as high priority for the Sacramento and San Joaquin Rivers Basin.

- Regulatory Guidance to Address Water Bodies Dominated by NPDES Discharges
- Regulatory Guidance for Salinity and Boron Discharges to the San Joaquin River
- Organophosphorus (OP) Pesticide Control Efforts
- Mercury Load Reduction Program
- Dissolved Oxygen Problems in the San Joaquin River near Stockton
- Waivers
- Policies for Maintaining Water Quality for Drinking Water

Resources to complete these high priority activities have been provided by the stakeholders, the TMDL program, agricultural drainage program, and CALFED. Some resources have also been drawn from the point source regulatory and nonpoint source programs.

The issues selected for the 2002 Triennial Review represent major water quality concerns based on what is currently known about them. Knowledge about pollution problems may change significantly from one year to the next.

**Issue 1:**

**Regulatory Guidance to Address Water Bodies  
Dominated by NPDES Discharges**

**Discussion:**

It is sometimes difficult and expensive for dischargers to meet water quality objectives in water bodies dominated by NPDES discharges, also known as effluent dominated water bodies (EDWs). Where little or no dilution is available, effluent limits are set at not greater than the applicable water quality standard, including narrative and numeric water quality objectives contained in the Basin Plan, numerical standards included in the National Toxics Rule, the California Toxics Rule, or other criteria used to assure compliance with narrative water quality objectives. Common parameters that have proven difficult to meet in typical discharges from wastewater treatment plants include copper, zinc, arsenic, pesticides and various organic compounds. In addition, the water quality objectives for turbidity, temperature, dissolved oxygen and pH are often violated. These four objectives are based on allowing only limited changes to background conditions. Background stream conditions typically fluctuate and respond more quickly to environmental changes (i.e., rainfall, changes in air temperature) than effluents from wastewater treatment facilities. In some cases, wastewater treatment plants are capable of discharging high quality effluent that would fully protect beneficial uses and yet still be in violation of the Basin Plan. The consistent flows provided by the wastewater discharge may also enhance some aquatic life beneficial uses but be detrimental to others that depend on the ephemeral nature of the stream. The original conditions in the stream may change, causing a shift in the specific uses within a beneficial use category (i.e. a shift from the unique uses of ephemeral waters to the uses of a perennial water). There are questions of whether the discharger should be required to fully protect these shifted uses when it is the discharge itself that allows the modified uses to exist at all. There are also questions regarding the fate of the original uses that are lost due to the discharge.

The beneficial uses of the water bodies are based on the Basin Plan designated uses. Studies necessary to comply with Clean Water Act and California Water Code requirements for modifying or dedesignating

beneficial uses have not been completed for most EDWs. Stakeholders have suggested that various alternatives be explored for assigning beneficial uses to EDWs. The alternatives suggested were to a) designate site specific beneficial uses, b) use “warm” and “cold” designations on a case by case basis rather than applying the “tributary rule,” c) develop an EDW beneficial use which would consist of a limited warm water habitat, recreation and/or municipal use, d) adopt site specific objectives, or e) develop provisions for granting variances from compliance with water quality objectives.

All of the above alternatives can only be accomplished through the Basin Plan amendment process. They cannot be performed during the permit adoption process. Because of the number of water bodies where action is needed, alternative policies and actions need to be considered.

Priority:

High

Current Action:

Because EDWs are a statewide concern, the State Water Board has taken the lead in developing a policy to address this issue. The State and Regional Water Boards have identified EDWs as a key project to meet the strategic plan goal to protect surface water beneficial uses. Regional Water Board staff will work with State Water Board staff to develop a strategy for addressing EDWs. This may include any or all of the following:

- Developing a policy to identify which water bodies are EDWs;
- Identifying appropriate beneficial uses through Use Attainability Analyses (UAAs); and
- Developing site-specific or basin-wide objectives applicable to this special situation.

Currently, staff is coordinating an EDW stakeholder group, which is made up of dischargers and other interested parties. This group has met five times in the past year to discuss current and potential efforts to address EDW related issues. Due to resource constraints, staff will continue to provide minimal coordination support for this stakeholder group. As

regional issues are identified, the Regional Water Board will address them as resources allow.

Planning staff is currently working on three Basin Plan Amendments (BPAs) that directly address EDW concerns. The first is a site specific BPA for pH, and turbidity for Deer Creek into which El Dorado Irrigation District's Deer Creek Wastewater Treatment Plant discharges. The second is a site specific BPA for temperature in Deer Creek. The third is a basin-wide BPA for pH and turbidity that staff is developing with assistance from the Basin Plan Advisory Committee - a coalition of dischargers organized by the City of Roseville and a subcommittee of the EDW Stakeholder Group.

Current Resources:

- 1) Staff -- 1.5 PYs per year for FY01/02 and 02/03 PYs (funded by stakeholders)
- 2) Contract(s) -- \$0

Additional Action:

Funding has not been secured for full facilitation and coordination of the EDW stakeholder group. The stakeholder group is an important resource to help identify regional concerns. As regional issues that relate to EDWs are identified, study parameters will need to be developed, studies will need to be conducted, and basin plan amendments will need to be administered.

Two regional issues that have been recently identified are the MUN beneficial use in constructed water bodies and the COLD beneficial use in water bodies that cannot and will not support COLD.

Additional Resources  
Requirements:

- 1) Staff -- 0.5 PY for three years to oversee and administer each basin plan amendment and 0.25 PY per year to continue coordinating the EDW stakeholder group.
- 2) Contract(s) -- Approximately \$500,000 for each study.

**Issue 2:**

**Regulatory Guidance for Salinity and Boron  
Discharges to the San Joaquin River**

Discussion:

Water quality in the San Joaquin River has degraded significantly since the late 1940s. During this period, salt concentrations in the River, near Vernalis, have doubled and boron levels have increased significantly. These increases are primarily due to reservoir development and water diversions on the east side tributaries and upper basin for agricultural development, the use of poorer quality Delta water in lieu of San Joaquin River water on west side agricultural lands and drainage from upslope soils on the west side of the San Joaquin Valley. The lower San Joaquin River, namely that part of the River from Mendota Pool to the Delta, along with its tributaries Mud Slough (north) and Salt Slough have been listed in the Clean Water Act Section 303(d) list as impaired due to boron and salts. The Clean Water Act requires that states establish total maximum daily load limits (TMDL) for all Section 303(d) listed water bodies.

Salinity water quality objectives were adopted by the State Water Board for the San Joaquin River at Vernalis (the mouth of the Sacramento-San Joaquin River Delta) in the Water Quality Control Plan for Salinity in the Sacramento-San Joaquin River Delta (Delta Plan). The Delta Plan objective is not applicable to the upstream portion of the river so the State Water Board directed the Regional Water Board to set numerical objectives for salinity in the San Joaquin River upstream of Vernalis. Water quality objectives for boron were adopted in 1988, but were rejected by the USEPA. However, USEPA has not promulgated new boron standards. Present levels of salts and boron have impaired agricultural beneficial uses and interfered with fulfillment of water contract deliveries.

Recognizing the importance of controlling salts in the San Joaquin River and restoring beneficial uses, the Regional Water Board instructed staff to develop a program to control salts in the San Joaquin River. The Regional Water Board also identified the development of a Total Maximum Daily Load Model for boron and salts as a high priority. A TMDL provides a means by which to restore the integrity of the water bodies with

respect to the pollutant in question by establishing the assimilative capacity of the water body and apportioning loads of the pollutant to the various sources and including a margin of safety.

Priority:

High

Current Action:

A TMDL technical report was completed in January 2002 to allocate the salt and boron loads in the San Joaquin River based on objectives for these constituents at Vernalis. To maximize resources, the basin plan amendment to incorporate the implementation plan for this TMDL will be coordinated with the basin plan amendment to adopt salt and boron objectives for the San Joaquin River upstream of Vernalis.

Staff held workshops in April and May 1999 to discuss a basin plan amendment to adopt water quality objectives for salt and boron and an implementation plan to achieve the proposed objectives. Stakeholders questioned the proposed basin plan amendment, specifically, they were concerned that the beneficial uses were not appropriate, the proposed implementation plan lacked detail, and there was an insufficient economic analysis. Staff will evaluate the comments and propose an analysis of the beneficial uses and economics by June 2002. A draft basin plan amendment will be released in October 2002 that will include a proposal for a coordinated implementation plan to achieve the new water quality objectives and address the TMDL loads to meet objectives at Vernalis. Staff proposes to present the basin plan amendment to the Regional Water Board in March 2003. Staff will work with stakeholders to develop the objectives and implementation plan, prepare the staff reports supporting the amendment, and process the amendment (complete CEQA analysis and documentation, prepare agenda items, conduct hearings and workshops, prepare the record for State Water Board and the Office of Administrative Law (OAL), conduct peer review, and respond to OAL concerns). The implementation plan will evaluate all reasonable alternatives, including the adoption of waste discharge requirements.

Current Resources:

1) Staff -- 2.5 PY per year from agricultural drainage resources

2) Contract(s) -- \$0

Additional Action: Follow up on implementation.

Additional Resources  
Requirements:

- 1) Staff -- 2.0 PY per year for several years.
- 2) Contract(s) -- \$50,000 per year for water quality monitoring in the San Joaquin River to ensure the effectiveness of the implementation plan.

**Issue 3: OP Pesticide Control Efforts**

Discussion:

The organophosphorus (OP) pesticides diazinon and chlorpyrifos have been documented at toxic levels in numerous surface water bodies. Diazinon has been documented at toxic levels in the San Joaquin River, Sacramento River, Feather River, the Delta and tributaries to these water bodies. Chlorpyrifos has been documented at toxic levels in the San Joaquin River, the Delta and tributaries to these waters. These water bodies have been listed on the Clean Water Act Section 303(d) list of impaired water bodies. The Clean Water Act mandates that the Regional Water Board develop load reduction programs to resolve these water quality problems through a Total Maximum Daily Load (TMDL) allocation process. In addition, the implementation chapter of the Basin Plan outlines a specific review process that the Regional Water Board must follow to address pesticide problems that are identified.

To address the OP pesticide problem, the Regional Water Board has initiated steps to amend the Basin Plan to establish water quality objectives and an implementation program. Federal requirements to develop TMDL allocations will also be addressed in this process. Public workshops and hearings will be held as part of the Basin Planning process to address OP pesticides. These public hearings will provide the review process that was established in the Basin Plan for addressing problem pesticides. The 1998 Clean Water Act Section 303(d) list identifies development of TMDLs for the San Joaquin River, Sacramento River,



Feather River and Delta for the OP pesticides as a high priority activity.

Priority:

High

Current Action:

Regional Water Board staff is working with the Department of Pesticide Regulation, stakeholder groups, industry representatives, various commodity Boards, pesticide registrants and environmental groups to support efforts to develop management practices to reduce the levels of the pesticides reaching surface waters. CALFED has funded numerous projects directed toward development of these practices in agricultural and urban settings. Additional CALFED resources have been allocated to address questions about the ecological significance of observed levels of pesticides in and around the Delta. The Department of Fish and Game has completed their work on criteria for chlorpyrifos and diazinon. In the San Joaquin River, the loads and sources of pesticides have been well defined during drought periods. More information is still needed in the Delta and Sacramento River watershed.

Staff is currently compiling the information necessary to develop control programs for diazinon in the Sacramento and Feather Rivers and diazinon and chlorpyrifos in the San Joaquin River. A Regional Water Board hearing to consider amendment of the Basin Plan is anticipated no later than June 2003.

After completion of the above TMDLs, some of the staff will begin work on implementation oversight and some of the staff will begin work on developing TMDLs for some of the San Joaquin River tributaries and urban streams in Stockton.

Current Resources:

- 1) Staff -- 6 PYs for FY02/03 and 2 PY for FY03/04 to complete the work in the Sacramento and the San Joaquin Rivers and urban streams in Sacramento County from the TMDL program. 1 PY per year for FY02/03 and 03/04 for Delta work from the CALFED program.

- 2) Contract(s) -- \$500,000 in FY02/03 is provided from the TMDL program to conduct source analysis.

Additional Action: Monitoring to establish the sources in the remaining Sacramento and San Joaquin River tributaries and development of TMDLs for these water bodies.

Additional Resources  
Requirements:

- 1) Staff -- 3 PYs per year
- 2) Contract(s) -- \$300,000 per year for monitoring

**Issue 4: Mercury Load Reduction Program (TMDL)**

Discussion: Mercury has been identified as a problem in the Delta and its tributaries and in Clear Lake and Cache Creek because it accumulates in aquatic organisms to levels that pose a threat to predator species and people that eat fish. Elevated mercury levels can be expected in areas where mercury was mined (Coast Range), where mercury was used to extract gold (Sierra Nevada and Cascade Range), and in downstream water bodies. Because of elevated mercury levels in fish tissue, numerous water bodies, including the Delta, have been included on the Clean Water Act Section 303(d) list of impaired water bodies. The Clean Water Act mandates that the Regional Water Board develop load reduction programs to resolve these water quality problems through a Total Maximum Daily Load (TMDL) allocation process.

The 1998 Clean Water Act Section 303(d) list identified mercury TMDL work as a high priority in the Delta and its tributaries and in Clear Lake and Cache Creek.

Priority: High

Current Action: Mercury cycling in the aquatic environment and the accumulation process in aquatic organisms is not well understood. Therefore, setting a reasonable goal in aquatic organisms and determining which sources are most important to control is not an easy task. A significant amount of study and research needs to be completed up front in order to have much of a chance for success. CALFED is funding studies on mercury in

the water column, sediments, invertebrates, and fish. Both state and federal contract funds are being used for monitoring and analysis. Currently, data is being collected for loading studies in the Delta, Sacramento River, San Joaquin River and the Cache Creek watersheds. A plan is being developed by a team that includes some of the foremost experts on mercury in the country. It also includes local stakeholder support and input.

Currently, seven TMDLs are in development. As these are incorporated into the basin plan, TMDL development staff will be able to work on implementation of adopted TMDLs and development of other mercury TMDLs.

- Current Resources:
- 1) Staff -- 6 PYs per year from TMDL and CALFED resources
  - 2) Contract(s) -- \$125,000 per year from TMDL resources
- Additional Action:
- Conduct source monitoring to refine the implementation program for watersheds upstream of the Delta and to support Clean Water Act Section 303(d) listings.
- Additional Resource Requirements:
- 1) Staff -- 2 PYs per year
  - 2) Contract(s) -- \$500,000 per year

**Issue 5: Dissolved Oxygen Problems in San Joaquin River near Stockton**

Discussion:

Low dissolved oxygen concentrations in the San Joaquin River in the vicinity of Stockton annually impact or threaten to impact beneficial uses. Basin Plan water quality objectives are frequently violated during high temperature periods in late summer and early fall. Adult San Joaquin River fall run Chinook salmon migrate up river between September and December to spawn in the Merced, Tuolumne, and Stanislaus Rivers. The San Joaquin River population has experienced severe declines and is considered a species of concern by the US Fish and Wildlife Service. Low dissolved

oxygen in the San Joaquin River can act as a barrier to migration. Low dissolved oxygen levels can kill or stress salmon and other species present in this portion of the Delta. A computer model developed for the Stockton Wastewater Treatment Plant identified ammonia and BOD as the primary cause of the low dissolved oxygen concentrations. The sources are discharges from the treatment plant, and surrounding and upstream point and nonpoint sources. River flow and water temperature, upstream algal blooms and sediment oxygen demand were identified as key factors influencing dissolved oxygen levels. The San Joaquin River is on the Clean Water Act Section 303(d) list of impaired water bodies due to low dissolved oxygen. The Clean Water Act mandates that the Regional Water Board develop load reduction programs to resolve these water quality problems through a Total Maximum Daily Load (TMDL) allocation process. In addition, this part of the Delta was listed as a Toxic Hot Spot under the Bay Protection and Toxic Cleanup Program and a Cleanup Plan was adopted to address this issue.

Priority:

High

Current Action:

Staff has worked with stakeholders to form a steering committee. The steering committee has implemented a plan of action to develop waste load allocations and an implementation plan after evaluation of alternatives. The steering committee is scheduled to provide a waste load allocations and implementation plan report to the Regional Water Board in December 2002. The Regional Water Board is scheduled to consider a basin plan amendment on this matter in June 2004.

Current Resources:

- 1) Staff -- 1 PY per year funded with CALFED resources
- 2) Contract(s) -- \$0 (Significant resources from CALFED and other stakeholders have funded studies used to develop the TMDL.)

**Issue 6:**

**Waivers**

Discussion:

The Basin Plan includes a list of types of discharges that the Regional Water Board does not expect to pose a threat to water quality and, thus, conditionally waived

the need to issue waste discharge requirements. Section 13269 of the California Water Code allows these existing waivers to remain in effect until 1 January 2003. After that, they may be renewed by the Regional Water Board in five-year increments after a review of the terms, conditions and effectiveness of each waiver, conducted at a public hearing. However, prior to adopting a waiver, the Regional Water Board must first comply with the California Environmental Quality Act.

Priority:

High

Current Action:

The State Water Board is working with the Regional Water Boards to develop an implementation plan to efficiently review existing waivers. Each Regional Water Board is developing a list of the waiver categories that need to be evaluated and what regulatory options currently exist to handle each category.

Current Resources:

- 1) Staff -- 2 PYs per year from regulatory, nonpoint source, and agricultural drainage programs.
- 2) Contract(s) -- \$450,000 to monitor agricultural return flows

Additional Action:

The inclusion of types of waivers in the Basin Plan is for informational purposes only. Waivers adopted under California Water Code Section 13269 and waste discharge requirements issued under California Water Code Section 13263 are not subject to the basin planning process. However, if management options such as prohibitions and time schedules are to be included, basin plan amendments may be needed. Actual tasks cannot be identified prior to examining each waiver category.

Additional Resource  
Requirements:

- 1) Staff -- 0.5 PY for three years to oversee and administer each basin plan amendment (assuming that the work to substantiate the basin plan amendment will be completed by the current resources that were redirected from regulatory, agricultural drainage and nonpoint source resources)
- 2) Contract(s) -- \$0

**Issue 7:**

**Policies for Maintaining Water Quality for Drinking Water**

**Discussion:**

The Sacramento/San Joaquin River Delta is the source of drinking water for two thirds of the state's population (over 20 million people). The two principal rivers discharging to the Delta, the Sacramento and San Joaquin Rivers, receive pollutants from the various land uses in the Central Valley including, agriculture, mining, confined animal facilities, and urban runoff. These pollutants include pesticides, trace elements, metals, nutrients, and pathogens. The Delta and segments of the Sacramento and the San Joaquin Rivers are listed in the Clean Water Act Section 303(d) list due to impairment of beneficial uses by many of these pollutants. Due to increased intensity of development and coincident population growth, the demand for high quality drinking water will increase. Additionally, development within the watershed may increase the pollutant loads into these waters posing a greater threat to drinking water supplies.

State Water Board Resolution No. 88-63 (Sources of Drinking Water Policy), which is incorporated into the Basin Plan, recognizes municipal and domestic water supply (MUN) beneficial uses in all surface waters, with a few limited exceptions. Several water quality objectives to protect drinking water supplies are contained in Title 22 of the California Water Code and have been incorporated by reference into the Basin Plan for the protection of waters designated MUN.

Maximum Contaminant Levels (MCLs) exist for parameters such as arsenic, lead, cadmium, silver, selenium, and organochlorine pesticides. Other constituents of concern for sources of drinking water include precursors to disinfection by-products (organic carbon and bromide), salinity, and pathogens. The Regional Water Board is involved in programs to address salinity problems in the San Joaquin River watershed. The other constituents of concerns are not being addressed by the Regional Water Board at this time.

In response to directives in the 1996 Reauthorization of the federal Safe Drinking Water Act, the USEPA has

been developing more stringent regulations with respect to controlling and reducing levels of disinfection by-products (DBPs) and pathogens.

One of the regulations promulgated by the USEPA is the Stage 1 Disinfection By-product (D/DBP) Rule which reduces the allowable levels of DBPs by lowering the MCL for trihalomethanes (THM) and establishing MCLs for five haloacetic acids (HAA5) and bromate. Another feature of the rule is the regulation of total organic carbon (TOC). The rule requires the removal of organic material in the source water through advanced treatment (e.g., enhanced coagulation or precipitation). Reducing the amount of TOC will reduce the amount of DBPs formation, enhance the effectiveness of the disinfectant to inactivate pathogens and reduce the costs of water disinfection.

Delta waters are unusually high in dissolved organic matter. Sources of TOC include agricultural drainage discharges originating from organic soils of the Delta and introduced from the Sacramento and San Joaquin Rivers. Median Delta water bromide concentrations are more than 6 times the national median. The THM formation potential of Delta water is more than double the national median. These two factors make it difficult and expensive for Delta water purveyors to meet the new and anticipated regulations.

A report of the California Urban Water Agencies (CUWA) concluded that TOC levels in the Delta would have to be reduced to less than 3 mg/L and bromide to less than 50 ug/L in order to provide flexibility in the use of enhanced coagulation and ozone disinfection to meet the long-term regulatory scenario. Present concentrations of TOC at the Harvey Banks pumping plant range between 2.6 and 10.5 mg/L and the median bromide concentration is 290 ug/L. Without reduction of precursors to the levels recommended in the CUWA report, more expensive advanced treatment technologies such as granular activated carbon or membranes would have to be used. The cost of treatment and disposal of residues would make these options prohibitive. CUWA estimates that complying with the TOC removal provisions (enhanced

coagulation) of stage 1 of the D/DBP Rule alone would cost an additional \$16 to \$34 per acre-foot. Without reducing the precursors to the recommended levels, the cost of membrane treatment was estimated between \$140 and \$650 per acre-foot to comply with the likely long-term regulatory scenario.

Another rule being promulgated by the USEPA is the Interim Enhanced Surface Water Treatment (IESWT) Rule. One of the requirements of this rule is 2 – log (99%) *cryptosporidium* removal for systems that filter. The longer-term implementation of this rule will probably require Cryptosporidium and Giardia removal and inactivation standards.

The D/DBP and Long-term Enhanced Surface Treatment rules are in conflict because microbe inactivation provisions will require greater use of chlorine and ozone disinfectants, which in turn generate higher levels of DBPs. High concentrations of precursors not only are problematic from the standpoint of DBP generation in excess of regulatory limits but also because precursors consume disinfectant, thus requiring greater quantities of disinfectant to achieve effective disinfection. Precursors also interfere with the treatment selection options. For example, use of the more effective disinfectant ozone for Cryptosporidium inactivation or to avoid THM and HAA5 generation, in the presence of bromide, will generate bromate, which is a regulated DBP.

In addition to pathogens and DBP precursors, concerns have also been expressed with salinity. Salinity impacts the palatability of drinking water and impacts the re-use of the water. Reclaimed water has higher salinity levels than the source water. Increasing the salinity of the source water may increase the salinity level of reclaimed water to a level which may no longer be suitable for re-use such as landscape irrigation or groundwater recharge.

The promulgation of drinking water regulations raises concerns regarding water constituents not previously regulated by the Regional Water Board. The CALFED Record of Decision obligates the Regional Water Board, with support from the CALFED agencies and



the Department of Health Services (DHS), to develop and adopt a policy for sources of drinking water by the end of 2004. This policy is to include identification and implementation of appropriate pollutant source control measures, focused regulatory and/or incentive programs targeting pollutants of concern, and development of a monitoring and assessment program. Particular interest has been expressed by the stakeholders for development of a water quality objective for total organic carbon (TOC).

Priority: High

Current Action: Regional Water Board Staff are working with CUWA, CALFED, the Department of Water Resources (DWR) and other interested stakeholders to develop a monitoring program to support the development of a policy for Sources of Drinking Water

Current Resources: 1) Staff -- 1.0 PY for FY 02/03 (funded by stakeholders)  
2) Contract(s) -- \$0

Additional Action: Work with CUWA, DWR, DHS CALFED and other interested stakeholders to refine a workplan for development of the policy and begin to collect information that will be required for policy development. Any policy developed would need to be adopted into the Basin Plan and would require approval of the State Water Board, OAL, and USEPA.

Additional Resource Requirements: 1) Staff -- 1.0 PYs per year to work with stakeholders to develop a policy and oversee and manage any basin plan amendments. 0.5 PY for three years to oversee and manage contracts.  
2) Contract(s) -- \$500,000 per year for monitoring and technical support.

**Issue 8: Policy for On-Site Disposal Systems**

Discussion: There are approximately 500,000 single-family residential septic systems in the Central Valley Region that discharge 150 million gallons of sewage per day.

Failed septic systems impact groundwater with nutrients and pathogens. In order to perform adequately, on-site systems must be properly designed, located, installed and maintained. The Regional Water Board's policy has been that control of individual waste treatment and disposal systems can best be accomplished by local county environmental health departments if these departments strictly enforce an ordinance that is designed to provide complete protection for groundwater and surface water quality and for public health.

More than 25 years ago the Regional Water Board established guidelines for siting and operation of individual disposal systems. These guidelines were designed to protect water quality and are intended to be implemented through county government ordinances. In recent years, there has been a proliferation of residential and urban development in the Sierra Nevada foothills that utilize individual disposal systems. Some of these developments are likely to be sited in areas inadequate for septic systems due to steep slope, shallow soils and fractured rock geology. The Regional Water Board guidelines do not address non-alluvial siting of individual disposal systems. In addition, the guidelines do not address alternative systems that may provide protection of ground and surface waters beyond a traditional septic tank and leachfield system. These guidelines are obsolete and need to be updated and then enforced.

Priority:

Medium

Current Action:

The State Water Board has been required under Section 13291 of the California Water Code to adopt regulatory standards for the permitting and operation of onsite sewage treatment systems by 1 January 2004. The State Water Board has formed advisory groups to help develop these regulations. Regional Water Board staff is participating in the advisory groups. Section 13291(e) of the California Water Code requires the Regional Water Board to incorporate the State Water Board regulations into the Basin Plan.

Current Resources:

1) Staff -- 0.1 PYs per year from regulatory resources

2) Contract(s) -- \$0

**Issue 9:**

**Water Quality Objectives for Carbofuran, Malathion, Methyl Parathion, Molinate, and Thiobencarb**

**Discussion:**

The Basin Plan prohibits the discharge of irrigation return flows containing the five pesticides unless the discharger is following a management practice approved by the Regional Water Board. On a regular basis, the Department of Pesticide Regulation presents, for Regional Water Board approval, the management practices that are required to be implemented to control the levels of these five pesticides in surface waters. The management practices are not approved unless they are expected to meet performance goals that are included in the Basin Plan. The Basin Plan indicates that performance goals are to be periodically evaluated. Numerical water quality objectives have not yet been adopted for these five pesticides (except for a thiobencarb objective to protect municipal supplies). In addition, other pesticides are being used that are not directly addressed in the Basin Plan.

**Priority:**

Medium

**Current Action:**

None

**Current Resources:**

None

**Additional Action:**

Develop site-specific objectives for these and possibly other high use chemicals.

**Additional Resource Requirements:**

1) Staff -- 0.5 PY per year to evaluate existing information to propose appropriate water quality objectives. 1.0 PY for the year that administration of the basin plan process will be needed.

2) Contract(s) -- \$0

**Issue 10:**

**Temperature Objectives to Protect Spring Run Salmon and Steelhead**

**Discussion:**

For most water bodies in the Region that have aquatic habitat beneficial uses, the general temperature

objective is that “*at no time or place should waters be increased more than 5 degrees Fahrenheit above natural receiving water temperature.*” This objective is not adequately protective in certain key streams critical to spring run salmon and steelhead.

Mortality to developing eggs and embryos may begin when daily average water temperatures exceed 56 degrees Fahrenheit and reaches 100 percent at 62 degrees Fahrenheit. A water temperature increase of 5 degrees Fahrenheit in cold water streams could result in water temperatures exceeding the maximum safe level for the survival and development of embryonic and juvenile life stages of salmon and steelhead.

Furthermore, water temperatures exceeding 60 degrees Fahrenheit are deleterious to adult spring-run salmon. The effects of temperature on the growth and survival of salmonid eggs, alevins, and fry have been well documented. The effects of temperature on adult spring-run salmon are less clear. Typically, adult spring-run salmon hold in freshwater over the summer months before spawning in early fall. It is believed that they are particularly vulnerable to high water temperatures while holding in the summer.

The spring-run Chinook salmon has been listed as Threatened under the California Endangered Species Act. Efforts are currently underway by state and federal agencies and stakeholder groups to protect and possibly enhance these populations. Establishing maximum temperature limits in these streams would help assure their viability and support the COLD, SPWN, MIGR and RARE beneficial uses of streams.

Priority: Medium

Current Action: None

Current Resources: None

Additional Action: Establish maximum temperature limits in streams and/or stream segments that need protection for sustaining anadromous salmonid populations. Consider deleting the 5 degree increase limit where maximum temperature limits are established and consider the

economic consequences to point and nonpoint source dischargers, especially agriculture.

Additional Resource  
Requirements:

- 1) Staff -- 0.5 PY for three years to oversee and administer the basin plan amendment
- 2) Contract(s) -- \$500,000 for a temperature study and \$200,000 for an economics review.

**Issue 11:**

**Regulatory Actions in Agricultural Dominated Water Bodies and Agricultural Conveyance Facilities**

Discussion:

In agricultural environments, a complex network of modified natural and constructed channels convey irrigation supplies to farms and export agricultural drainage water to natural streams. Many of the constructed and artificial channels lack habitat and physical flow characteristics of natural channels required to sustain the full range of aquatic life and other beneficial uses. Additionally, in natural channels whose flow is dominated by agricultural drainage, water quality may be less than needed to protect aquatic life and other beneficial uses. In the Sacramento and San Joaquin River Basins, it is estimated that more than 130 natural water bodies, totaling more than 1100 miles, are dominated by agricultural drainage and supply water. There are more than 4100 water bodies, totaling over 9300 miles, which are constructed facilities designed to carry agricultural drainage and supply water. There are more than 75 water bodies, totaling almost 600 miles, that are natural dry washes that have been altered to carry agricultural supply or drainage water.

Table II-I of the Basin Plan lists surface water bodies and beneficial uses that are designated for those water bodies. The Basin Plan states that the beneficial uses of any specifically identified water body generally apply to its tributary streams. In cases where this is not appropriate, the Basin Plan indicates that beneficial uses will be evaluated on a case-by-case basis. These site-specific evaluations and adjustments to these “tributary rule” derived beneficial uses can only be made through the Basin Plan revision process that

would need to include all the considerations that are specified in Porter-Cologne and be consistent with requirements of the Clean Water Act. In the absence of the site-specific studies, beneficial uses are assumed to be the same as for the downstream water body that is listed in the Basin Plan and applicable water quality objectives are the same as for the mainstream rivers.

Water bodies that receive agricultural drainage can be impaired due to elevated levels of pesticides and other contaminants. These water bodies typically do not achieve full protection of beneficial uses. Increased regulation of agricultural discharges to these water bodies may lead to reduced flow and lower attainment of beneficial uses.

Priority:

Medium

Current Action:

Certain water bodies are both effluent dominated and agriculturally dominated. Issues that are identified as part of the work on Effluent Dominated Water Bodies (EDWs) that relate to Agriculturally Dominated Water Bodies will be addressed as part of the EDWs effort. See Issue No. 1 for more details on the status of EDWs.

Current Resources:

None specific to this issue

Additional Action:

Development of a strategy to specifically address agricultural dominated water bodies. This may include evaluation of any or all of the following:

- A policy to identify which water bodies are agricultural dominated water bodies;
- Appropriate beneficial uses through Use Attainability Analyses (UAAs); and
- Site-specific objectives or develop basin-wide objectives applicable to this special situation.

Each of these evaluations may require separate studies for each water body.

Additional Resource  
Requirements:

- 1) Staff -- 0.5 PY for three years to oversee and administer each basin plan amendment

- 2) Contract(s) -- Approximately \$500,000 for each study.

**Issue 12:                                      Need for Groundwater Survey and Control Policies  
for Discharges to Groundwater**

Discussion:                                      The Basin Plan describes various groundwater quality problems that exist throughout the region and includes numerous policies that address prevention and cleanup of groundwater quality problems. Nevertheless, large portions of some aquifers are being degraded by elevated levels of salt, nitrates, pesticides and other contaminants. There are programs in place that are designed to address localized problems (i.e., underground tank and site cleanup program) but there has been no organized effort to address the wide spread problems of nitrates and salts. A major effort is needed to assess the current conditions, determine the factors contributing to present groundwater impacts, and develop policies that can be used to correct existing problems and prevent future problems.

Nitrates. A 1988 State Water Board report to the State Legislature on Nitrate in Drinking Water (SWRCB, 1988) reported that 10 percent of the samples in STORET (the USEPA database) were above the primary Maximum Contaminant Level (10 mg/L nitrate-nitrogen). A geographical depiction of wells with levels of nitrate above background (greater than 4.5 mg/L nitrate-nitrogen) showed the highest densities in the Central Valley are close to the Highway 99 corridor and primarily around population centers (e.g. Modesto, Yuba City, Fresno, and Bakersfield) and concentrated animal confinement areas (e.g. feedlots and dairies). Since 1980, over 200 municipal water supply wells have been closed in the Central Valley due to exceedance of the nitrate Maximum Contaminant Level (RWQCB, 1996).

The actual nitrate groundwater contamination situation may be much greater than realized by the SWRCB geographical depiction and statistics of closed wells. The groundwater nitrate database is biased with respect to large water systems as these systems receive more scrutiny than small water systems. Domestic wells with less than 15 connections are not subject to state

oversight and those with less than 5 connections are not subject to any monitoring requirements. It is these small systems which are most vulnerable to contamination by nitrate. These wells are generally placed in shallow aquifers due to limited resources and yield requirements of small and private systems. Large water supply systems, on the other hand, with greater economic resources, generally tap deeper aquifers where there is more reliable water supply and quality. Additionally, small systems are more likely located in rural areas, generally agricultural. Recent monitoring by the US Geological Survey of 60 household wells located in one agricultural area found 30 percent of the wells exceeded the drinking water standard.

The primary health concerns with the consumption of water with elevated nitrate is the condition known as methemoglobinemia. Methemoglobinemia, more commonly known as the “blue baby syndrome,” is the interference by nitrate to the absorption of oxygen by hemoglobin in the blood. Infants, younger than 6 months, are most susceptible and the oxygen deficit in the blood stream produces blue coloration of the lips and skin and hence the term “blue baby.” More severe cases result in death. The health impacts to infants subject to chronic oxygen deprivation, as a result of nitrate consumption in drinking water, which do not result in mortality, are unknown. The condition is often misdiagnosed and is believed to be under reported. A survey of hospital discharge records by the Department of Health Services (DHS) between 1983 and 1995 revealed 97 cases of methemoglobinemia in children younger than one year. The database, however, was incomplete and it could not be determined how many cases were attributable to consumption of nitrate contaminated groundwater as other factors can also lead to this condition, such as aerosol deodorizers and certain pharmaceuticals.

According to the SWRCB report to the legislature, \$48.7 million were requested from DHS in 1986 for bond funds to remediate groundwater impacted by nitrate. The Central Valley accounted for 60 percent of the applications for bond money for small water systems and 35 percent for large water systems. Stanislaus County alone accounted for 21 percent of all



of the applications statewide. Water systems impacted with nitrate exceeding the Maximum Contaminant Level must be blended with uncontaminated water, treated by ion exchange, or closed. The report to the legislature stated that the USEPA estimated the annual increase in household water bill to treat nitrate contaminated water at between \$77 to \$340 for water systems of 100 to 1,000,000 people served.

The primary sources of nitrate in groundwater are application of nitrogen fertilizers, disposal or reuse of animal waste at confined animal production facilities, and individual sewer systems (septic systems).

Areas of intensive crop production in highly permeable soils, especially of crops with a high nitrogen demand (e.g., vegetables, citrus, and silage corn), are known or suspected of causing elevated nitrate levels in the groundwater (e.g., Salinas Valley, Chico Basin and Hilmar Area of Merced County). Groundwater in crop production areas can become contaminated with nitrate when nitrogen fertilizers are applied at rates in excess of crop utilization and inefficient irrigation or high rainfall leach the nitrate to groundwater. Other factors that put groundwater at risk are a shallow aquifer, the absence of a restricting layer to vertical migration of nitrate, permeable soils and poor well construction. The Regional Water Board has no programs that address nitrate used in crop production.

In 1993, the Regional Water Board conducted a survey of groundwater beneath five typical well operated dairies in the vicinity of Hilmar. The average nitrate-nitrogen concentration beneath these dairies was 49 mg/L with a maximum value of 250 mg/L. This far exceeds the drinking water standard of 10 mg/L. Conditions were conducive to migration of nitrates to groundwater as soils are highly permeable (sandy) and the water table is shallow (4 to 25 below ground surface). There are 1600 dairies in the Central Valley with approximately 1 million milking cows. At present, the Regional Water Board is requiring groundwater monitoring at approximately 20 dairies. However, there are no sites undergoing remediation.

With respect to individual septic systems, the Regional Water Board has dealt with these on a case-by-case basis by prohibiting discharge in problematic service areas. Twenty-six prohibitions have been adopted by the Regional Water Board. The Regional Water Board has also adopted guidelines for use of septic tank systems in developments. Staff has encouraged counties to adopt and enforce ordinances that are consistent with the guidelines. However, these guidelines are now outdated and the State Water Board is working on regulations to be adopted by 1 January 2004. See Issue No. 8 for a more detailed description.

Salt. Salts, as measured by Total Dissolved Solids (TDS) or electrical conductivity (EC) are of concern because they interfere with agricultural, industrial, and domestic beneficial uses of groundwater. Groundwater with less than 450 mg/L TDS (EC of 700 mhos/cm) are acceptable for all agricultural uses. At levels exceeding this value, reduction in crop yields and/or germination failure may result depending on the sensitivity of the crop. A range of secondary Maximum Contaminant Levels, which are based on aesthetics (taste, odor, appearance) have been established for TDS; 500 mg/L is the recommended level; 1,000 mg/L is the maximum level if no other source is reasonably available; and 1,500 is the short-term limit which is acceptable on a temporary basis. The Basin Plan incorporates the Maximum Contaminant Levels by reference for the protection of municipal and domestic supply of groundwater. No numerical water quality objectives are specified in the Basin Plan for the protection of agricultural beneficial uses.

Some of the salt load to the groundwater resource is primarily the result of natural processes within the Basin. This includes salt loads from the valley floor runoff, native surface waters, and leached from the soils by precipitation.

Salts that are not indigenous to the Basin water resources result from man's activity. Salts come from imported water, salt leached by irrigation, animal wastes, fertilizers and other soil amendments, municipal use, and municipal industrial wastewater discharges to land for treatment, storage and disposal.

Salts in groundwater are primarily a problem in the San Joaquin River Basin. Approximately 600,000 tons of salt are imported annually into the western portion of the San Joaquin Basin (west of the San Joaquin River) for crop irrigation and wetland management via federal, state, and local water projects. An additional 160,000 tons are applied through irrigation from San Joaquin River diversions. Some of this salt is returned to the river through tail water return flows and some is stored in the soil. Most, however, is purposefully leached below the root zone to maintain salt balance in the root zone. Much of this leached salt ends up in the groundwater.

The extent of groundwater impacted by elevated levels of salt are unknown, as groundwater quality data from shallow aquifers is scant. However, a portion of the western San Joaquin River Basin is known to have shallow groundwater and soils with high levels of soluble salts. Between 1977 and 1987 the acreage of farmland affected by shallow groundwater (5 feet or less) increased by 53 percent to 817,000 acres (SJVDP, 1990). Most of this water is too saline to be used for municipal, domestic, industrial, or agricultural purposes. Deeper aquifers, which are used for municipal drinking water supply, may be impacted in the future through transport of salts across leaky aquitards or through improperly abandoned wells or older wells that were not designed to prevent hydraulic connection between aquifers.

No proven means exist at present to allow ongoing human activity in the Basin while maintaining groundwater salinity at current levels. Degradation of groundwater in the San Joaquin River Basin by salts is unavoidable without a plan to remove salts from the basin. The Regional Water Board's present policy supports a drain to carry salts out of the valley as the best technical solution to this water quality problem. The drain could carry wastewater generated by municipal, industrial, and agricultural activities, high in salt and unfit for reuse. The only other solution is to manage the rate of degradation by minimizing the salt loads to the groundwater body.

Staff of the Regional Water Board is presently developing a control plan for salinity in the San Joaquin River. The control program, however, will only deal with control of loads discharged to the River. Since groundwater inflow is a contributor of salt to the river and beneficial uses of groundwater are being impacted, a parallel control plan needs to be established for the control of salts to groundwater. Additionally, as urbanization of the Central Valley continues, groundwater resources are becoming an increasingly important source of municipal supply. Steps to restore, maintain, and protect the quality of this supply need to be established.

Priority: Medium

Current Action: The Supplemental Report of the 1999 Budget Act required the State Water Board to develop a comprehensive ambient groundwater monitoring plan. To meet this mandate, the SWRCB created the Groundwater Ambient Monitoring and Assessment (GAMA) Program. The primary objective of the GAMA Program is to assess the water quality and relative susceptibility of groundwater resources.

Current Resources: None

Additional Action: In the absence of a uniform statewide program for dealing with the impacts of nitrates and salt on groundwater quality, the Regional Water Board should develop a program to address these issues. The Regional Water Board needs to develop strategies and implementation programs that allow all ground waters to be maintained as close to natural concentrations of dissolved matter as is reasonable considering careful use and management of water resources. Stakeholder groups should be convened to identify management measures that would reduce the amount of nitrates and salt leached to ground water.

Additional Resource  
Requirements:

- 1) Staff -- 2 PYs per year for three years
- 2) Contract(s) -- \$100,000 per year for three years

**Issue 13:**

**Sediments**

Discussion:

Accelerated erosion from subdivision construction, agricultural land conversion, highway construction, and nonpoint source activities contributes to turbidity and sedimentation in the region's streams. The Regional Water Board recognized this problem in 1979 and adopted guidelines to reduce erosion from agriculture and subdivision construction. No additional review has been done since then and sediments continue to impact streams. These sediments may be impairing the municipal, recreational and aquatic life beneficial uses of affected water bodies.

Priority:

Medium

Current Action:

Erosion from construction activities disturbing 5 acres or more is being addressed through stormwater permits. Beginning in March of 2003, small construction activities disturbing between 1 and 5 acres will also be subject to stormwater permitting. Activities in riparian areas may also be subject to water quality certification requirements.

Current Resources:

- 1) Staff -- No resources are available to address the basin plan portion of this issue; however, stormwater and water quality certification resources are available to carry out the mandated activities under these two programs as described above.
- 2) Contract(s) -- \$0

Additional Action:

Although some erosion issues are being addressed through our stormwater and water quality certification programs, other erosion-causing activities would still be addressed by the Erosion/Sedimentation guidelines. The Erosion/Sedimentation guidelines in the Basin Plan are outdated. Potential sedimentation sources need to be evaluated, and the guidelines should be revised as necessary and re-incorporated into the Basin Plan.

Additional Resource  
Requirements:

- 1) Staff -- 2.0 PYs for two years
- 2) Contract(s) -- \$0

**Issue 14:**

**Beneficial Use Designations for Surface Water  
Bodies Not Listed in Table II-I**

Discussion:

Table II-I of the Basin Plan lists surface water bodies and beneficial uses that are designated for those water bodies. The beneficial uses of any specifically listed water body generally apply to its tributary streams. In cases where this is not appropriate, the Basin Plan indicates that beneficial uses will be evaluated on a case-by-case basis. These site-specific evaluations and adjustments to these “tributary rule” derived beneficial uses can only be made through the Basin Plan revision process. Many of the unlisted water bodies do not support the same beneficial uses as the downstream water body so the beneficial uses of water bodies may not be adequately protected. In some cases, the unlisted water bodies are effluent dominated (EDW) or agriculturally dominated (ADW). More details on EDWs and ADWs are contained in Issue Nos. 1 and 11, above. Beneficial uses for these water bodies will be addressed as part of the EDW or ADW issues.

Priority:

Medium

Current Action:

None specific to this issue for water bodies that are not EDWs.

Current Resources:

None

Additional Action:

Because of the large number and size of the unlisted water bodies, categorizing them and assigning beneficial uses to the various categories would involve the most efficient use of resources. Staff would assemble and work with a stakeholder group to define the issues associated with any general classification system and to determine the best and most efficient approach to the assignment of beneficial uses.

Additional Resources  
Requirements:

- 1) Staff -- 1.0 PY for the first year to further define this issue.
- 2) Contract(s) -- Approximately \$500,000 to help identify the scope of this issue.

**Issue 15:**

**Revisions to Beneficial Uses for Surface Waters  
Listed on Table II-I**

Discussion:

Table II-I in the Basin Plan contains a list of surface water bodies with specific identified beneficial uses. Current information appears to support adding uses to some of these surface waters. In addition, information exists that appears to support including beneficial uses for commercial and sport fishing (COMM), rare, threatened or endangered species (RARE), preservation of biological habitats of special significance (BIOL), ground water recharge (GWR) and freshwater replenishment (FRSH), which are currently not used in the Sacramento River and San Joaquin River basins. Detailed studies would need to be conducted to determine water quality objectives that are appropriate to protect beneficial uses not currently used in the Basin Plan.

Most surface waters listed in the Basin Plan are assigned municipal and domestic supply, contact recreation, and aquatic life beneficial uses. Water quality needed to support these beneficial uses should also be sufficient to support any of the proposed beneficial uses described above. Staff is not aware of any special water quality protection required for any of the proposed beneficial uses.

Priority:

Low

Current Action:

None.

Current Resources:

None

Additional Action:

Develop data requirements for information needed to modify beneficial uses. Deletion of beneficial uses must meet federal Clean Water Act requirements as detailed in a use attainability analysis (UAA) and must meet the requirements of CEQA.

Consideration of identifying new use designations for COMM, RARE, BIOL, GWR and FRSH and developing water quality objectives to protect these uses would also require the development and submittal of additional supporting information.

Additional Resource  
Requirements:

- 1) Staff -- 0.5 PYs to oversee addition of beneficial uses if there is adequate supporting documentation. 1.0 PY per year to conduct studies to identify COMM, RARE, BIOL, GWR and FRSH for listed water bodies.
- 2) Contract(s) -- Approximately \$500,000 per beneficial use not currently in use in the Basin Plan to determine data requirements for listing and the appropriate water quality objectives.

**Issue 16:**

**Ammonia Objectives**

Discussion:

The Basin Plan does not contain a numerical water quality objective for ammonia. In determining permit limits, staff relies on application of narrative objectives. Limits are placed in permits that take into account ammonia toxicity information, taste and odor thresholds, receiving water characteristics, available dilution and other considerations. Staff also relies on the 1991 USEPA Technical Support Document that discussed permit derivation procedures. The narrative toxicity objective and the *Policy for Application of Water Quality Objectives* in the Implementation Plan Chapter of the Basin Plan indicate that the Regional Water Board can use available information and numerical criteria and guidelines from other authoritative bodies to assist in determining compliance with narrative objectives. Therefore, the information that is contained in the USEPA Technical Support Document and numerical criteria and guidelines may be used by staff to derive permit limits. However, non-uniform translation of narrative water quality objectives could be impairing the Regional Water Board's ability to properly protect the beneficial uses of its waters.

Priority:

Low

Current Action:

None

Current Resources:

None.

Additional Action:

Develop water quality objectives for ammonia. Staff will work with interested stakeholders to finalize



ammonia objectives to prevent toxicity and adverse tastes and odors.

Additional Resource  
Requirements:

- 1) Staff -- About 0.5 PYs for two years
- 2) Contract(s) -- \$0

**Issue 17:**

**Chlorine Objectives**

Discussion:

The Basin Plan does not contain a numerical water quality objective for chlorine. In determining permit limits, staff relies on application of the narrative objective. Limits are placed in permits that take into account chlorine toxicity information, receiving water characteristics, available dilution and other considerations. The narrative toxicity objective and the Policy for Application of Water Quality Objectives in the Implementation Plan Chapter of the Basin Plan indicate that the Regional Water Board can use available information and numerical criteria and guidelines from other authoritative bodies to assist in determining compliance with the objective. However, non-uniform translation of narrative water quality objectives could be impairing the Regional Water Board's ability to properly protect the beneficial uses of its waters.

Priority:

Low

Current Action:

None

Current Resources:

None

Additional Action:

Develop water quality objectives for chlorine. Staff will work with interested stakeholders to finalize chlorine objectives.

Additional Resource  
Requirements:

- 1) Staff -- About 0.5 PYs per year for two years
- 2) Contract(s) -- \$0

**Issue 18:**

**Dissolved Oxygen Objectives**

Discussion:

The basin plan includes general dissolved oxygen objectives that apply to all water bodies designated as supporting warm freshwater habitat (WARM), cold freshwater habitat (COLD) and fish spawning (SPWN). The objectives are applied as minimum levels that are to be equaled or exceeded at all times. These objectives have existed in the Basin Plan since its original adoption in 1975. In 1986, the USEPA developed National Criteria for dissolved oxygen. The National Criteria have not been evaluated for use in the Sacramento River and San Joaquin River Basins. However, the narrative toxicity objective in the Basin Plan and the *Policy for Application of Water Quality Objectives* in the Implementation Plan Chapter of the Basin Plan indicate that the Regional Water Board may use available information and numerical criteria and guidelines from other authoritative bodies to assist in determining compliance with the objective.

Priority:

Low

Current Action:

None

Current Resources:

None

Additional Action:

Re-evaluate the water quality objectives for dissolved oxygen. Staff will work with interested stakeholders to finalize dissolved oxygen objectives.

Additional Resource  
Requirements:

- 1) Staff -- About 0.5 PYs per year for two years
- 2) Contract(s) -- \$0